Supplementary Information

Supplementary Tables

Major element compositions of host and daughter crystals: Table 1 reports composition for host-olivine. No daughter olivine has been found. The number for each olivine analysis represents the melt inclusion number hosted by the olivine. The letters "NI" indicates a second analysis for the same olivine host near the melt inclusion. Table 2 reports analyses for daughter and host-clinopyroxene. The analyses for the hosts are labeled with an "H". The number next to the word "pyroxene" is the melt inclusion number the clinopyroxene either hosts or crystallized from. The letters "c' and "m" indicates core and margin respectively of the crystal analyzed. Table 3, 4 and 5 reports the major element compositions for carbonate globules and sulfides within the melt inclusion, and for spinels trapped in the melt inclusion and in the olivine (reads "in Ol") respectively. No daughter minerals have been analyzed for the Pitcairn sample. Major element compositions of host crystals and daughter minerals were measured on a JEOL 733 electron microprobe at the Massachusetts Institute of Technology. We applied the correction methods of Bence and Albee (1968) and Albee and Ray (1970). The typical operating conditions used were an accelerating voltage of 15 keV and currents of 10 nAmps. Counting times ranges from 20 to 40 seconds. The in-run precision is mainly produced by counting statistics, which varies with the abundance of the elements. For example, for a single analysis, the uncertainties are approximately $1\sigma \leq 1\%$ for contents $\geq$ 1 wt%, 1σ between 1 to 5% for 1-0.5 wt %, $1\sigma \approx 5$ to 15% for content of 0.5-0.1 wt % and $1\sigma > 15\%$ for contents of less than 0.1%. The daughter and host mineral

compositions reported are averages of two to four analyses. The spot size ranges from 5μ for the daughter minerals and 10μ for the host minerals. In each table, the number next to the crystal name corresponds to the number assigned to the melt inclusion. Mg# = $Mg^{+2}/(Mg^{+2}+Fe^{+2})$ in molar proportion. Empty cells represent values below detection limit, and "NA" indicates not analyzed.

Supplementary Figure 1: $^{208}Pb/^{206}Pb$ (A) and $^{207}Pb/^{206}Pb$ (B) ratios for single melt inclusions versus the Cr content of daughter clinopyroxenes from Mangaia (MAG-B-47, MAG-B-25) and Tahaa (TAA-B-26). The negative correlation between the Cr content in the daughter clinopyroxenes and the Pb isotope ratios of the corresponding melt inclusion is mainly defined by MAG-B-47. Such correlation suggests that the melt with the isotopic composition closer to the "less radiogenic component" has either undergone differentiation prior to entrapment by the olivine phenocrysts, or originated from partial melting of a differentiated source (recycled oceanic crust, eclogite). The error bars for the $^{207}Pb/^{206}Pb$ ratios are in-run precision (2σ standard errors); for Cr content the error bars are standard deviation (2σ) from replicated analyses. Note that most Tahaa melt inclusions, with Pb isotope compositions close to that of the less radiogenic component, have daughter clinopyroxene with very low Cr contents. The only melt inclusions plotted from the ankaramite MAG-B-25 are those included in olivine host. Most host clinopyroxene analyzed from MAG-B25 tend to have higher Cr contents than those within olivine-hosted melt inclusions. Nevertheless, the host clinopyroxenes also show decreasing Cr contents as the melt inclusion becomes less radiogenic (See supplementary Table 2). Some of the data on this figure were previously published by Saal et al. (1998).

TABLE 1: Major element compositions of host Olivines

MAG B 47	OLIVINE 1	OLIVINE 2	OLIVINE 3	OLIVINE 4	OLIVINE 5	OLIVINE 6-7	OLIVINE 8	OLIVINE 9	OLIVINE 10	OLIVINE 11	OLIVINE 12-13	OLIVINE 12 NI	OLIVINE 14
SiO2	39.85	39.51	39.13	39.68	38.82	39.83	39.93	39.55	39.99	38.94	38.69	38.37	40.07
Cr2O3	0.03	0.02	0.04		0.02	0.01		0.04	0.05	0.03	0.04	0.03	0.07
FeO	13.11	13.01	15.02	14.03	17.32	15.44	14.58	13.16	13.58	13.09	17.21	23.52	12.83
MnO	0.20	0.18	0.24	0.21	0.27	0.22	0.24	0.18	0.22	0.20	0.28	0.17	0.17
MgO	47.24	46.65	45.30	46.49	44.45	45.45	45.98	47.22	46.03	47.09	43.55	10.81	47.33
CaO	0.38	0.43	0.42	0.40	0.40	0.40	0.40	0.35	0.43	0.32	0.38	0.45	0.46
NiO	0.23	0.21	0.17	0.26	0.19	0.22	0.20	0.26	0.25	0.22	0.19	0.10	0.24
Total	101.04	100.00	100.32	101.05	101.46	101.57	101.32	100.76	100.54	99.87	100.33	73.43	101.16
Mg#	0.87	0.86	0.84	0.86	0.82	0.84	0.85	0.86	0.86	0.87	0.82	0.45	0.87
		0.88											

MAG B 25	OLIVINE NI 2	OLIVINE 2	OLIVINE NI 3	OLIVINE 3	OLIVINE NI 6	OLIVINE 6-7	OLIVINE NI13	OLIVINE 12-13	OLIVINE NI14	OLIVINE 14	OLIVINE NI15	OLIVINE 15	OLIVINE NI17
SiO2	38.55	38.21	38.30	38.58	38.75	38.41	38.39	38.56	38.73	38.92	38.04	38.61	39.02
Cr2O3				0.04	0.01	0.04	0.02	0.09	0.05	0.04	0.06	0.03	0.05
FeO	17.88	18.19	17.76	18.42	17.92	18.15	17.18	17.43	16.50	16.46	18.43	18.67	16.51
MnO	0.25	0.26	0.30	0.26	0.27	0.09	0.08	0.09	0.04	0.07	0.14	0.09	0.06
MgO	43.20	43.10	43.08	43.01	42.84	42.88	43.07	43.04	43.63	43.96	42.80	42.22	44.72
CaO	0.38	0.44	0.39	0.41	0.40	0.40	0.42	0.38	0.43	0.44	0.43	0.36	0.48
NiO	0.15	0.16	0.17	0.17	0.18	0.03	0.04	0.02	0.04	0.05	0.03	0.04	0.05
Total	100.40	100.35	99.99	100.89	100.38	100.01	99.20	99.60	99.40	99.94	99.93	100.00	100.90
Mg#	0.81	0.81	0.81	0.81	0.81	0.81	0.82	0.81	0.83	0.83	0.81	0.80	0.83

TAA B 26	OLIVINE 1	OLIVINE 3	OLIVINE 4	OLIVINE 5-6	OLIVINE 7	OLIVINE 8	OLIVINE 9	OLIVINE 10	OLIVINE 12	OLIVINE 14	OLIVINE 17	OLIVINE 18	OLIVINE 20
SiO2	38.56	38.63	38.67	38.92	38.85	39.16	38.55	38.88	39.10	38.49	38.87	38.75	38.81
Cr2O3				0.03	0.05	0.05	0.05	0.02	0.02	0.01	0.04		0.01
FeO	19.75	19.97	19.23	19.85	19.57	19.47	19.56	19.06	18.96	19.83	20.29	19.46	19.63
MnO	0.25	0.27	0.25	0.27	0.25	0.26	0.26	0.25	0.22	0.24	0.26	0.25	0.25
MgO	41.19	41.97	42.14	42.15	41.16	41.48	41.51	43.07	41.65	41.03	41.01	41.57	41.60
CaO	0.34	0.32	0.29	0.32	0.28	0.25	0.31	0.32	0.30	0.27	0.32	0.29	0.30
NiO	0.18	0.13	0.19	0.17	0.22	0.22	0.20	0.25	0.25	0.20	0.18	0.21	0.23
Total	100.27	101.30	100.77	101.70	100.38	100.88	100.45	101.83	100.48	100.08	100.97	100.53	100.83
Mg#	0.79	0.79	0.80	0.79	0.79	0.79	0.79	0.80	0.80	0.79	0.78	0.79	0.79

PIT 1	OLIVINE 5	OLIVINE 22	OLIVINE 23	OLIVINE 25	OLIVINE 27	OLIVINE 32	OLIVINE 46	OLIVINE 48	OLIVINE 52	OLIVINE 54	OLIVINE 59	OLIVINE 73	OLIVINE 81
SiO2	38.54	38.52	38.33	38.57	38.41	38.51	38.68	38.44	38.77	38.33	38.20	38.38	38.43
Cr2O3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FeO	18.37	18.53	18.65	18.29	18.80	18.41	18.67	19.89	18.31	18.62	18.96	18.47	19.17
MnO	0.25	0.26	0.25	0.24	0.24	0.24	0.25	0.28	0.25	0.25	0.25	0.26	0.26
MgO	41.86	41.71	41.63	41.75	41.32	41.68	41.67	40.86	41.67	41.39	41.23	41.74	40.91
CaO	0.25	0.24	0.26	0.24	0.25	0.26	0.24	0.26	0.24	0.26	0.25	0.24	0.26
NiO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total	99.27	99.25	99.11	99.08	99.02	99.09	99.51	99.73	99.24	98.85	98.90	99.10	99.03
Mg#	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.79	0.80	0.80	0.79	0.80	0.79

TABLE 1: Major element compositions of host Olivines

MAG B 47	OLIVINE 15	OLIVINE 16	OLIVINE 17	OLIVINE 18	OLIVINE 19-20	OLIVINE 21	OLIVINE 22	OLIVINE 23	OLIVINE 24	OLIVINE 25	OLIVINE 26-27	OLIVINE 28	OLIVINE 29-30
SiO2	39.25	39.95	39.36	39.45	39.43	38.69	39.24	38.92	38.55	39.46	39.48	40.10	39.95
Cr2O3	0.04	0.07	0.02		0.06	0.06	0.03	0.05	0.04	0.04	0.04	0.02	0.05
FeO	15.36	13.13	13.15	17.93	14.50	22.60	15.16	18.09	17.82	14.90	15.12	14.62	13.32
MnO	0.23	0.17	0.21	0.27	0.22	0.38	0.25	0.25	0.30	0.23	0.27	0.22	0.21
MgO	45.86	47.01	48.58	42.90	45.63	38.25	45.29	43.62	44.11	46.66	46.45	45.57	47.15
CaO	0.47	0.35	0.38	0.39	0.41	0.48	0.37	0.39	0.38	0.31	0.38	0.43	0.42
NiO	0.23	0.21	0.27	0.20	0.21	0.18	0.24	0.23	0.21	0.19	0.24	0.22	0.24
Total	101.44	100.88	101.98	101.14	100.46	100.64	100.58	101.54	101.41	101.78	101.97	101.18	101.33
Mg#	0.84	0.86	0.87	0.81	0.85	0.75	0.84	0.81	0.82	0.85	0.85	0.85	0.86

MAG B 25	OLIVINE 17	OLIVINE NI 34	OLIVINE 34	OLIVINE NI37	OLIVINE 37	OLIVINE NI40	OLIVINE 40	OLIVINE NI43	OLIVINE 43	OLIVINE NI 47	OLIVINE 46-47	OLIVINE NI48	OLIVINE 48
SiO2	39.19	39.17	38.74	39.44	38.91	38.90	38.63	38.94	38.00	37.96	38.35	38.82	38.95
Cr2O3	0.06	0.08	0.04	0.04	0.03		0.04	0.02	0.04	0.04	0.03	0.06	0.02
FeO	16.37	16.96	16.80	17.76	18.01	17.90	17.90	17.80	17.08	18.13	18.10	16.98	17.20
MnO	0.05	0.25	0.26	0.25	0.23	0.20	0.26	0.29	0.24	0.22	0.26	0.23	0.22
MgO	44.09	42.86	43.74	41.97	42.74	42.95	43.28	42.16	42.16	43.36	43.11	43.42	43.61
CaO	0.37	0.41	0.36	0.44	0.41	0.46	0.43	0.51	0.40	0.41	0.40	0.47	0.38
NiO	0.03	0.20	0.19	0.15	0.15	0.15	0.18	0.17	0.15	0.15	0.14	0.17	0.19
Total	100.16	99.93	100.14	100.03	100.48	100.56	100.72	99.88	98.06	100.27	100.39	100.15	100.58
Mg#	0.83	0.82	0.82	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.82	0.82

TAA B 26	OLIVINE 21	OLIVINE 22	OLIVINE 23	OLIVINE 24	OLIVINE 25	OLIVINE 28	OLIVINE 30	OLIVINE 32	OLIVINE 35	OLIVINE 37	OLIVINE 40	OLIVINE NI 41	OLIVINE 41
SiO2	38.46	38.64	38.83	38.59	38.56	38.43	38.44	38.60	38.44	38.83	38.61	38.26	38.70
Cr2O3	0.07		0.02	0.02		0.04	0.04	0.03	0.02	0.01		0.04	
FeO	19.45	19.46	19.65	19.43	19.83	19.71	19.66	19.46	18.94	19.60	19.60	19.83	19.48
MnO	0.28	0.25	0.25	0.26	0.26	0.26	0.29	0.25	0.22	0.23	0.25	0.25	0.30
MgO	41.49	41.94	41.49	41.74	41.18	41.51	41.95	41.63	42.79	41.75	41.40	41.45	40.94
CaO	0.30	0.28	0.35	0.32	0.29	0.31	0.29	0.29	0.28	0.30	0.29	0.30	0.30
NiO	0.23	0.21	0.18	0.19	0.18	0.18	0.17	0.21	0.23	0.18	0.20	0.19	0.19
Total	100.28	100.77	100.78	100.54	100.30	100.45	100.84	100.48	100.90	100.90	100.34	100.32	99.90
Mg#	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.80	0.79	0.79	0.79	0.79

PIT 1	OLIVINE 83	OLIVINE 89	OLIVINE 91
SiO2	38.43	38.63	38.63
Cr2O3	NA	NA	NA
FeO	18.59	18.24	19.02
MnO	0.25	0.26	0.27
MgO	41.58	41.95	41.10
CaO	0.25	0.22	0.25
NiO	NA	NA	NA
Total	99.10	99.29	99.28
Mg#	0.80	0.80	0.79

TABLE 1: Major element compositions of host Olivines

MAG B 47	OLIVINE 31	OLIVINE 32	OLIVINE 33	OLIVINE 33	OLIVINE 34	OLIVINE 35-36	OLIVINE 37	OLIVINE 38	OLIVINE 39	OLIVINE 40	OLIVINE 41	OLIVINE 42-43	OLIVINE 44-45
SiO2	39.19	39.21	38.98	36.62	39.84	39.45	39.62	39.77	39.93	39.57	39.65	39.27	38.24
Cr2O3	0.04	0.06	0.03	0.06	0.06	0.05	0.03	0.05	0.03	0.04			
FeO	15.40	14.88	16.09	15.24	12.94	14.97	15.05	13.39	13.13	14.90	17.38	15.79	18.80
MnO	0.24	0.23	0.23	0.28	0.19	0.26	0.22	0.22	0.20	0.21	0.26	0.22	0.29
MgO	46.36	45.61	43.35	41.33	47.04	45.28	45.92	47.66	47.33	45.49	43.53	44.40	41.03
CaO	0.41	0.42	0.37	0.54	0.39	0.43	0.39	0.42	0.43	0.44	0.35	0.39	0.44
NiO	0.23	0.17	0.22	0.21	0.24	0.21	0.22	0.27	0.22	0.21	0.20	0.20	0.19
Total	101.87	100.59	99.26	94.28	100.71	100.65	101.45	101.77	101.25	100.85	101.36	100.28	98.99
Mg#	0.84	0.85	0.83	0.83	0.87	0.84	0.84	0.86	0.87	0.84	0.82	0.83	0.80

MAG B 25	OLIVINE NI49	OLIVINE 49	OLIVINE NI52	OLIVINE 52	OLIVINE NI53	OLIVINE 53	OLIVINE NI54
SiO2	38.69	38.00	38.64	38.59	39.68	38.94	37.94
Cr2O3	0.03	0.02	0.06	0.04	0.05	0.03	0.04
FeO	16.68	16.74	17.93	17.78	18.10	18.02	18.16
MnO	0.21	0.26	0.24	0.25	0.25	0.33	0.31
MgO	43.37	43.80	43.19	42.67	40.76	42.69	44.01
CaO	0.49	0.40	0.45	0.38	0.40	0.41	0.45
NiO	0.17	0.13	0.13	0.17	0.18	0.26	0.18
Total	99.63	99.34	100.63	99.88	99.42	100.67	101.08
Mg#	0.82	0.82	0.81	0.81	0.80	0.81	0.81

TAA B 26	OLIVINE 43	OLIVINE 48	OLIVINE 49	OLIVINE 50	OLIVINE 51	OLIVINE 52	OLIVINE 53	OLIVINE 58	OLIVINE 59	OLIVINE 61	OLIVINE 62	OLIVINE 63	OLIVINE 66
SiO2	38.58	38.47	38.57	38.67	38.22	38.61	38.56	38.79	38.53	38.64	39.35	38.04	38.04
Cr2O3	0.04	0.05	0.02	0.04	0.03	0.02	0.04					0.05	0.01
FeO	19.47	19.85	19.71	19.81	18.69	18.78	19.69	19.69	19.75	19.99	19.96	19.06	19.33
MnO	0.26	0.22	0.30	0.29	0.24	0.25	0.26	0.32	0.26	0.27	0.27	0.23	0.27
MgO	41.62	40.76	41.89	41.88	41.76	42.12	41.87	41.52	41.78	41.69	41.27	42.20	41.96
CaO	0.33	0.26	0.31	0.31	0.31	0.29	0.28	0.31	0.28	0.27	0.28	0.26	0.26
NiO	0.20	0.20	0.16	0.19	0.21	0.20	0.19	0.19	0.21	0.23	0.21	0.23	0.22
Total	100.48	99.81	100.95	101.19	99.47	100.27	100.89	100.82	100.79	101.08	101.36	100.06	100.09
Mg#	0.79	0.79	0.79	0.79	0.80	0.80	0.79	0.79	0.79	0.79	0.79	0.80	0.79

PIT 1
SiO2
Cr2O3
FeO
MnO
MgO
CaO
NiO
Total
Mg#

TABLE 1: Major element compositions of host Olivines

MAG B 47	OLIVINE 45 NI45A	OLIVINE 46-47	OLIVINE 48	OLIVINE 49	OLIVINE 50	OLIVINE 51	OLIVINE1 I51A	OLIVINE 52-53	OLIVINE 54	OLIVINE 55	OLIVINE 56	OLIVINE 57
SiO2	34.36	38.88	37.84	39.38	39.97	39.16	35.73	39.83	40.13	39.18	39.11	39.44
Cr2O3	0.03	0.03	0.01	0.04	0.05	0.02	0.16	0.04	0.04	0.07	0.04	0.03
FeO	39.06	17.26	18.91	13.15	13.33	17.86	34.30	14.69	14.23	12.94	13.08	14.37
MnO	0.71	0.29	0.29	0.22	0.22	0.27	0.65	0.20	0.21	0.17	0.19	0.21
MgO	23.05	43.53	41.68	46.95	47.07	43.43	27.55	44.94	46.13	47.52	43.88	44.88
CaO	0.81	0.41	0.42	0.39	0.34	0.57	0.71	0.44	0.36	0.41	0.40	0.39
NiO	0.05	0.20	0.17	0.17	0.25	0.17	0.12	0.23	0.23	0.20	0.24	0.24
Total	98.07	100.59	99.32	100.30	101.22	101.48	99.21	100.37	101.32	100.49	96.95	99.57
Mg#	0.51	0.82	0.80	0.86	0.86	0.81	0.59	0.85	0.85	0.87	0.86	0.85

MAG B 25
SiO2
Cr2O3
FeO
MnO
MgO
CaO
NiO
Total
Mg#

TAA B 26	OLIVINE 67	OLIVINE 68
SiO2	38.25	38.79
Cr2O3		0.01
FeO	19.61	19.56
MnO	0.25	0.26
MgO	41.84	41.55
CaO	0.32	0.29
NiO	0.20	0.20
Total	100.46	100.65
Mg#	0.79	0.79

PIT 1
SiO2
Cr2O3
FeO
MnO
MgO
CaO
NiO
Total
Mg#

TABLE 1: Major element compositions of host Olivines

MAG B 47	OLIVINE 58	OLIVINE 59	OLIVINE 60	OLIVINE 61	OLIVINE 61A	OLIVINE NI 62	OLIVINE 62	OLIVINE NI 63	OLIVINE 63	OLIVINE 64	OLIVINE NI 64	OLIVINE NI 66	OLIVINE 65-66
SiO2	39.39	38.32	39.13	38.36	38.66	38.10	39.06	39.12	39.40	39.62	40.36	45.88	38.83
Cr2O3	0.06	0.01	0.07	0.02	0.02	0.02	0.05	0.03	0.03	0.03		0.02	0.02
FeO	13.10	17.62	13.17	18.11	18.14	15.31	14.67	15.21	14.97	13.12	15.22	8.22	17.69
MnO	0.21	0.28	0.19	0.29	0.30	0.22	0.24	0.26	0.24	0.21	0.22	0.13	0.29
MgO	45.47	41.98	45.46	42.15	42.18	46.19	45.23	45.26	45.34	45.92	44.81	7.34	42.55
CaO	0.41	0.40	0.40	0.39	0.42	0.55	0.43	0.42	0.39	0.39	0.45	6.54	0.41
NiO	0.25	0.19	0.24	0.19	0.15	0.18	0.21	0.21	0.21	0.22	0.20	0.00	0.21
Total	98.87	98.80	98.66	99.51	99.86	100.56	99.88	100.51	100.59	99.52	101.26	68.14	100.01
Mg#	0.86	0.81	0.86	0.81	0.81	0.84	0.85	0.84	0.84	0.86	0.84	0.61	0.81

MAG B 25
SiO2
Cr2O3
FeO
MnO
MgO
CaO
NiO
Total
Mg#

TAA B 26
SiO2
Cr2O3
FeO
MnO
MgO
CaO
NiO
Total
Mg#

PIT 1
SiO2
Cr2O3
FeO
MnO
MgO
CaO
NiO
Total
Mg#

TABLE 1: Major element compositions of host Olivines

MAG B 47	OLIVINE NI 65	OLIVINE 67	OLIVINE NI 67	OLIVINE 68	OLIVINE 69	OLIVINE 70	OLIVINE 71	OLIVINE 72	OLIVINE I73
SiO2	38.90	39.10	38.21	39.45	39.11	39.04	39.31	38.91	38.43
Cr2O3	0.03	0.03	0.04	0.05	0.03	0.03	0.06	0.05	0.03
FeO	17.83	15.91	17.43	13.32	13.31	15.00	13.00	15.10	17.79
MnO	0.28	0.22	0.26	0.21	0.17	0.23	0.21	0.21	0.28
MgO	42.02	43.85	43.39	45.49	44.59	44.06	45.78	44.26	41.47
CaO	0.41	0.41	0.50	0.40	0.42	0.40	0.36	0.39	0.39
NiO	0.20	0.19	0.14	0.24	0.26	0.21	0.24	0.22	0.20
Total	99.68	99.71	99.97	99.16	97.89	98.98	98.96	99.15	98.58
Mg#	0.81	0.83	0.82	0.86	0.86	0.84	0.86	0.84	0.81

MAG B 25
SiO2
Cr2O3
FeO
MnO
MgO
CaO
NiO
Total
Mg#

TAA B 26
SiO2
Cr2O3
FeO
MnO
MgO
CaO
NiO
Total
Mg#

PIT 1
SiO2
Cr2O3
FeO
MnO
MgO
CaO
NiO
Total
Mg#

TABLE 2: Major element compositions of host and daughter Clinopyroxenes

MAG B 47	PYROXEN1	PYROXEN 6	PYROXEN 7	PYROXEN 8	PYROXEN 8	PYROXEN 9	PYROXEN 10	PYROXEN 11	PYROXEN 14	PYROXEN 15
SiO2	42.81	44.57	44.03	42.03	42.15	42.51	44.46	44.71	44.22	44.87
TiO2	5.87	4.54	4.64	5.24	5.56	4.59	4.08	3.72	4.47	2.84
Al2O3	9.80	12.17	10.65	10.65	12.28	10.40	10.04	9.95	9.54	8.76
Cr2O3	0.16	0.07	0.02	0.08	0.07	0.07	0.08	0.07	0.12	0.66
FeO	6.29	7.07	8.29	8.96	7.95	8.41	7.99	8.22	6.09	7.67
MnO	0.11	0.13	0.14	0.19	0.14	0.18	0.15	0.15	0.08	0.11
MgO	10.50	9.54	9.46	10.48	9.02	9.09	9.83	10.41	11.44	10.93
CaO	22.90	21.89	23.02	20.61	22.72	23.34	22.97	22.39	23.08	22.91
Na2O	0.65	0.80	0.69	0.54	0.68	0.89	0.63	0.53	0.72	0.59
Total	99.07	100.77	100.93	98.77	100.57	99.48	100.22	100.16	99.76	99.35
Mg#	0.75	0.71	0.67	0.68	0.67	0.66	0.69	0.69	0.77	0.72

MAG B 25	PYROXEN H1	PYROXEN H 4	PYROXEN H 5	PYROXEN H8-9	PYROXEN H10-11	PYROXEN H 18	PYROXEN H19-23	PYROXEN H24	PYROXEN H 25	PYROXEN H26
SiO2	50.56	49.62	50.12	50.84	50.06	51.29	51.29	50.90	50.92	50.53
TiO2	1.01	1.36	1.12	0.93	1.00	0.84	0.72	0.91	1.12	1.07
Al2O3	3.35	4.05	4.09	3.26	4.01	3.07	2.63	3.16	3.49	3.71
Cr2O3	0.66	0.64	0.97	0.78	0.91	0.64	0.90	0.60	0.48	0.81
FeO	5.16	5.37	4.95	4.91	4.99	4.89	4.31	4.83	5.29	4.74
MnO	0.12	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00
MgO	15.65	15.15	15.03	15.97	15.08	15.37	16.36	15.59	15.43	15.17
CaO	22.57	22.71	22.40	21.86	22.24	22.36	22.15	22.13	22.34	22.29
Na2O	0.33	0.45	0.47	0.42	0.47	0.38	0.41	0.38	0.38	0.36
Total	99.42	99.44	99.15	98.96	98.75	98.84	98.78	98.49	99.61	98.68
Mg#	0.84	0.83	0.84	0.85	0.84	0.85	0.87	0.85	0.84	0.85

TAA B 26	PYROXEN 1a	PYROXEN 1b	PYROXEN 2	PYROXEN 3	PYROXEN core 4	PYROXEN margin 4	PYROXEN 5	PYROXEN 6a	PYROXEN 6b	PYROXEN 8
SiO2	40.66	39.85	41.59	39.17	42.38	44.18	39.40	40.75	37.22	47.62
TiO2	5.91	5.98	6.90	6.05	3.73	3.32	7.54	2.36	7.03	2.44
Al2O3	13.34	13.00	12.24	13.75	14.57	18.02	13.47	13.83	17.28	12.47
Cr2O3	0.02	0.01	0.05			0.03	0.03			
FeO	8.00	7.97	6.66	9.55	7.52	6.50	8.81	7.21	8.84	9.66
MnO	0.02	0.13	0.08	0.05	0.05	0.06	0.12	0.07	0.09	0.16
MgO	8.93	8.99	10.79	7.62	8.68	2.95	9.16	10.18	6.74	6.19
CaO	21.03	22.18	22.42	22.76	23.39	16.03	21.78	23.54	21.95	19.78
Na2O	0.50	0.44	0.61	0.53	0.49	2.77	0.65	0.42	1.61	1.12
Total	98.42	98.54	101.33	99.48	100.81	93.86	100.95	98.36	100.74	99.44
Mg#	0.67	0.67	0.74	0.59	0.67	0.45	0.65	0.72	0.58	0.53

TABLE 2: Major element compositions of host and daughter Clinopyroxenes

MAG B 47	PYROXEN 16	PYROXEN 17	PYROXEN19	PYROXEN 20	PYROXEN 21	PYROXEN 21	PYROXEN 22	PYROXEN 23	PYROXEN 24	PYROXEN 27
SiO2	43.95	45.07	44.80	40.52	52.19	47.83	42.98	41.21	47.18	45.42
TiO2	4.87	4.01	6.07	7.47	0.79	2.72	5.26	5.84	2.58	3.05
Al2O3	10.60	8.24	10.22	12.48	3.03	6.49	12.98	14.70	11.61	9.07
Cr2O3	0.10	0.05	0.33	0.12	1.20	0.33	0.06	0.06	0.01	0.28
FeO	7.69	8.49	6.32	6.63	4.00	7.34	6.44	7.63	9.23	7.00
MnO	0.09	0.13	0.08	0.07	0.04	0.11	0.08	0.11	0.15	0.11
MgO	8.92	9.97	10.78	10.54	15.83	12.65	11.10	8.05	8.02	11.99
CaO	23.37	23.53	22.69	19.63	23.49	23.01	20.35	22.81	21.92	22.39
Na2O	0.62	0.74	0.69	0.46	0.32	0.44	1.09	0.61	0.81	0.72
Total	100.20	100.23	101.99	97.91	100.89	100.93	100.34	101.02	101.51	100.03
Mg#	0.67	0.68	0.75	0.74	0.88	0.75	0.75	0.65	0.61	0.75

MAG B 25	PYROXEN H27-28	PYROXEN H 29	PYROXEN H30-32	PYROXEN H35	PYROXEN H36	PYROXEN H38-39	PYROXEN H 41-42	PYROXEN H 44	PYROXEN H 45	PYROXEN H NI50
SiO2	50.52	50.65	50.99	50.86	48.66	50.94	50.43	50.36	50.80	49.64
TiO2	1.06	1.01	0.88	0.93	0.77	0.94	1.12	1.32	0.94	1.29
Al2O3	3.65	3.65	3.32	3.41	2.77	3.44	3.79	4.09	3.17	4.08
Cr2O3	0.68	0.65	0.64	0.60	0.63	0.77	0.51	0.26	0.37	0.63
FeO	5.12	5.17	4.86	4.69	4.27	4.80	4.84	5.50	4.86	5.67
MnO	0.37	0.22	0.23	0.08	0.00	0.00	0.00	0.00	0.00	0.05
MgO	15.44	15.59	15.53	15.65	16.84	15.41	15.25	14.79	15.51	14.27
CaO	22.52	22.08	21.80	22.20	22.30	22.01	22.19	22.36	22.37	22.83
Na2O	0.41	0.38	0.39	0.40	0.39	0.45	0.36	0.39	0.34	0.00
Total	99.76	99.37	98.63	98.81	96.63	98.75	98.47	99.06	98.35	98.47
Mg#	0.84	0.84	0.85	0.86	0.88	0.85	0.85	0.83	0.85	0.82

TAA B 26	PYROXEN 9	PYROXEN 10a	PYROXEN10b	PYROXEN 12	PYROXEN 14	PYROXEN 15	PYROXEN 16a	PYROXEN 16b	PYROXEN 16c	PYROXEN 17a
SiO2	43.29	39.07	43.34	44.02	39.98	45.28	49.30	50.28	43.31	49.02
TiO2	4.77	7.83	5.34	3.96	6.97	3.93	1.69	1.55	5.11	1.97
Al2O3	10.96	13.40	11.51	12.63	15.11	9.52	4.98	4.81	11.85	5.30
Cr2O3	0.15	0.04				0.06	0.90	0.86	0.12	0.62
FeO	7.61	7.35	8.06	9.51	9.15	7.48	6.44	6.35	5.99	6.88
MnO	0.10	0.12	0.15	0.13	0.12	0.15	0.12	0.13	0.15	0.13
MgO	11.60	9.61	11.52	6.68	10.47	12.44	14.93	15.03	11.58	14.77
CaO	21.79	22.29	20.61	21.93	17.33	21.74	21.90	21.89	21.93	21.86
Na2O	0.59	0.72	0.74	1.25	1.47	0.57	0.42	0.44	0.59	0.42
Total	100.85	100.42	101.27	100.11	100.62	101.18	100.67	101.32	100.63	100.97
Mg#	0.73	0.70	0.72	0.56	0.67	0.75	0.81	0.81	0.78	0.79

TABLE 2: Major element compositions of host and daughter Clinopyroxenes

MAG B 47	PYROXEN 29	PYROXEN 30	PYROXEN 31	PYROXEN 32	PYROXEN 33	PYROXEN 33A	PYROXEN 33B	PYROXEN 33B	PYROXEN 36	PYROXEN 37	PYROXEN 38
SiO2	44.50	45.59	41.77	43.61	43.02	46.22	43.26	48.20	40.93	41.54	42.31
TiO2	4.81	4.15	8.05	4.85	4.34	4.24	4.45	3.03	6.18	5.66	5.09
Al2O3	10.47	9.79	12.78	10.25	12.75	11.33	11.39	9.87	12.03	12.69	11.14
Cr2O3	0.12	0.10	0.08	0.18	0.01	0.11	0.06	0.07	0.03	0.08	0.04
FeO	5.79	6.36	7.35	6.94	7.49	7.33	7.68	6.76	7.05	8.01	7.95
MnO	0.07	0.10	0.09	0.09	0.11	0.14	0.15	0.14	0.09	0.10	0.09
MgO	10.79	11.19	7.71	11.12	9.11	10.22	9.93	12.66	9.89	11.65	8.64
CaO	23.33	23.10	23.02	22.84	22.52	21.04	22.24	21.52	22.78	18.97	23.08
Na2O	0.61	0.57	0.70	0.66	0.77	0.81	0.69	0.74	0.44	1.08	0.56
Total	100.49	100.97	101.54	100.54	100.12	101.43	99.84	102.99	99.41	99.80	98.91
Mg#	0.77	0.76	0.65	0.74	0.68	0.71	0.70	0.77	0.71	0.72	0.66

MAG B 25	PYROXEN H 50	PYROXEN H 51	PYROXEN H 54	PYROXEN H 56	PYROXEN 3	PYROXEN 6	PYROXEN 8	PYROXEN 12	PYROXEN 13	PYROXEN 14	PYROXEN 16
SiO2	49.55	50.91	51.01	50.96	40.17	40.81	51.87	41.71	40.63	40.03	40.10
TiO2	1.24	0.99	1.07	1.18	5.60	4.99	0.78	4.55	5.69	4.73	5.24
Al2O3	3.72	3.39	3.34	4.23	10.22	10.78	2.94	11.09	10.40	11.59	11.21
Cr2O3	0.37	0.57	0.56	0.86	0.07	0.04	0.98	0.03	0.02	0.06	
FeO	5.64	4.49	5.37	4.87	11.74	11.00	4.41	10.36	10.86	10.91	11.38
MnO	0.05	0.00	0.12	0.00	0.51	0.37	0.00	0.20	0.00	0.00	0.33
MgO	14.79	15.43	15.98	14.90	8.39	9.26	16.55	9.61	9.30	6.02	7.37
CaO	22.77	22.47	23.09	22.41	21.50	22.00	22.58	21.98	21.70	22.77	22.34
Na2O	0.00	0.36	0.32	0.41	0.78	0.65	0.36	0.66	0.76	0.66	0.63
Total	98.13	98.61	100.85	99.82	98.98	99.91	100.47	100.19	99.36	96.77	98.59
Mg#	0.82	0.86	0.84	0.85	0.56	0.60	0.87	0.62	0.60	0.50	0.54

TAA B 26	PYROXEN 17b	PYROXEN 18	PYROXEN 20	PYROXEN 21	PYROXEN 22	PYROXEN 30	PYROXEN 32	PYROXEN 33	PYROXEN 34	PYROXEN 40	PYROXEN 48a
SiO2	43.71	43.87	48.85	42.26	41.86	45.54	47.22	44.36	44.59	39.36	45.72
TiO2	4.33	4.98	2.39	3.04	5.39	3.61	2.93	4.26	4.33	6.76	3.87
Al2O3	10.24	12.26	5.03	13.86	12.07	8.83	7.08	8.39	10.58	14.76	9.16
Cr2O3	0.03	0.08			0.03	0.02	0.20	0.05	0.21		0.04
FeO	7.76	7.44	7.50	8.18	7.03	7.00	7.44	8.96	6.17	8.14	7.75
MnO	0.10	0.18	0.12	0.11	0.14	0.12	0.13	0.15	0.12	0.09	0.13
MgO	11.99	11.28	14.82	8.58	11.06	12.59	13.63	11.79	12.29	8.12	12.40
CaO	22.01	20.04	22.06	23.40	21.83	21.80	21.76	21.75	21.92	22.73	21.67
Na2O	0.51	0.95	0.35	0.45	0.62	0.45	0.46	0.52	0.58	0.61	0.53
Total	100.68	101.07	101.12	99.85	100.04	99.97	100.86	100.22	100.79	100.57	101.28
Mg#	0.73	0.73	0.78	0.65	0.74	0.76	0.77	0.70	0.78	0.64	0.74

TABLE 2: Major element compositions of host and daughter Clinopyroxenes

MAG B 47	PYROXEN 39	PYROXEN 39B	PYROXEN 40	PYROXEN 41	PYROXEN 42	PYROXEN 44	PYROXEN 45	PYROXEN 45A	PYROXEN 45A	PYROXEN 46	PYROXEN 48
SiO2	43.35	43.44	42.12	46.42	41.05	42.22	43.89	49.69	47.70	40.01	41.37
TiO2	4.14	4.72	5.00	2.08	5.24	5.43	2.91	1.50	2.91	5.51	5.81
Al2O3	9.70	10.28	10.46	6.71	13.70	13.38	10.24	1.52	4.35	13.06	13.35
Cr2O3	0.04	0.06	0.04	0.02	0.04					0.01	0.01
FeO	7.17	7.42	6.81	12.46	6.71	9.25	8.84	14.92	13.80	8.86	10.13
MnO	0.09	0.11	0.10	0.20	0.11	0.16	0.15	0.32	0.25	0.11	0.13
MgO	10.05	9.89	10.23	8.78	7.92	7.51	9.15	8.92	8.38	9.19	8.42
CaO	23.18	23.62	23.09	22.39	22.43	21.34	21.96	21.18	21.45	21.62	19.90
Na2O	0.41	0.58	0.50	0.63	0.66	0.96	0.42	1.12	0.99	0.92	1.02
Total	98.13	100.12	98.34	99.67	97.85	100.25	97.56	99.15	99.83	99.29	100.15
Mg#	0.71	0.70	0.73	0.56	0.68	0.59	0.65	0.52	0.52	0.65	0.60

MAG B 25	PYROXEN 17	PYROXEN 18	PYROXEN 30	PYROXEN 34	PYROXEN 37	PYROXEN 40	PYROXEN 40A	PYROXEN 43	PYROXEN 46	PYROXEN 49	PYROXEN 54
SiO2	41.37	45.62	42.86	41.49	47.91	43.96	41.16	42.68	41.83	42.90	45.17
TiO2	5.38	2.62	4.60	3.79	3.45	3.87	5.52	4.59	4.78	4.58	3.33
Al2O3	10.76	7.47	9.99	12.57	10.57	7.63	11.63	9.75	9.70	8.10	7.54
Cr2O3	0.01	0.41	0.02		0.02		0.04	0.09	0.04	0.08	0.04
FeO	9.80	7.54	9.96	10.57	9.79	11.22	10.59	10.25	11.01	10.55	10.24
MnO	0.36	0.07	0.15	0.12	0.15	0.19	0.14	0.15	0.19	0.17	0.20
MgO	9.34	11.98	9.84	8.05	8.35	9.62	7.65	9.15	8.34	9.42	10.88
CaO	21.99	22.30	21.50	23.44	20.15	21.82	21.07	21.44	21.55	21.65	21.77
Na2O	0.60	0.00	0.73	0.57	0.88	0.53	0.79	0.70	0.70	0.67	0.56
Total	99.60	98.01	99.64	100.59	101.26	98.84	98.57	98.79	98.13	98.11	99.72
Mg#	0.63	0.74	0.64	0.58	0.60	0.60	0.56	0.61	0.57	0.61	0.65

TAA B 26	PYROXEN 48b	PYROXEN 51a	PYROXEN 51b	PYROXEN 59a	PYROXEN 59b	PYROXEN 61	PYROXEN 66	PYROXEN 67
SiO2	39.79	40.44	24.80	37.77	41.28	45.56	43.54	41.97
TiO2	7.32	6.37	11.87	8.99	4.76	3.70	4.25	6.01
Al2O3	16.42	12.53	18.78	17.31	14.88	9.25	9.51	10.74
Cr2O3		0.01	0.01			0.02	0.06	0.03
FeO	8.25	6.63	18.72	10.74	7.60	6.53	7.53	7.37
MnO	0.12	0.14	0.15	0.14	0.09	0.14	0.10	0.11
MgO	12.95	10.44	12.83	9.99	8.52	13.13	12.19	11.67
CaO	11.70	23.52	12.47	12.16	22.97	22.36	22.28	21.94
Na2O	2.63	0.53	0.88	2.30	0.67	0.45	0.46	0.54
Total	99.16	100.60	100.49	99.38	100.77	101.14	99.91	100.37
Mg#	0.74	0.74	0.55	0.62	0.67	0.78	0.74	0.74

TABLE 2: Major element compositions of host and daughter Clinopyroxenes

MAG B 47	PYROXEN 49	PYROXEN 50	PYROXEN 51	PYROXEN 52	PYROXEN 53	PYROXEN 54	PYROXEN 54	PYROXEN 55	PYROXEN 56	PYROXEN 57	PYROXEN 58
SiO2	41.41	44.39	44.37	43.25	42.92	45.37	40.65	42.29	44.38	40.20	44.83
TiO2	8.04	4.25	4.07	4.51	4.86	3.65	5.79	5.52	4.22	6.92	4.75
Al2O3	11.80	10.61	9.58	11.64	10.17	9.48	12.80	12.03	9.98	12.83	10.29
Cr2O3	0.01	0.04		0.04	0.06	0.06	0.05	0.08	0.09	0.06	0.10
FeO	8.20	6.81	6.93	6.44	9.97	5.99	5.95	6.93	8.70	8.93	6.84
MnO	0.10	0.10	0.12	0.06	0.15	0.13	0.08	0.11	0.13	0.34	0.54
MgO	8.96	10.41	10.96	10.26	8.02	12.45	10.69	9.72	8.77	10.29	9.63
CaO	22.63	23.00	22.68	23.36	22.85	22.55	22.51	22.97	23.16	17.01	22.67
Na2O	0.64	0.52	0.50	0.49	0.57	0.45	0.63	0.59	0.59	1.81	0.56
Total	101.77	100.13	99.20	100.02	99.56	100.12	99.16	100.24	100.00	98.38	100.20
Mg#	0.66	0.73	0.74	0.74	0.59	0.79	0.76	0.71	0.64	0.67	0.72

MAG B 25	PYROXEN 56	PYROXEN 57
SiO2	39.75	48.10
TiO2	6.17	1.91
Al2O3	11.61	5.45
Cr2O3		0.28
FeO	10.61	6.14
MnO	0.14	0.06
MgO	8.25	14.36
CaO	21.40	22.72
Na2O	0.69	0.40
Total	98.61	99.43
Mg#	0.58	0.81

TAA B 26
SiO2
TiO2
Al2O3
Cr2O3
FeO
MnO
MgO
CaO
Na2O
Total
Mg#

TABLE 2: Major element compositions of host and daughter Clinopyroxenes

MAG B 47	PYROXEN 59	PYROXEN 60	PYROXEN 61	PYROXEN 62	PYROXEN 63	PYROXEN 64	PYROXEN 65	PYROXEN 66	PYROXEN 67	PYROXEN 69	PYROXEN 70
SiO2	41.72	43.65	42.78	43.43	44.78	42.96	39.86	41.62	42.52	43.47	45.34
TiO2	5.68	5.11	5.18	3.66	3.37	4.21	5.62	6.47	4.49	4.16	4.39
Al2O3	13.03	10.06	12.05	10.32	10.32	11.01	13.07	13.26	10.97	9.68	12.25
Cr2O3	0.06	0.09	0.02	0.06	0.11	0.03	0.09	0.06	0.11	0.06	0.14
FeO	9.33	7.38	7.64	7.35	7.28	6.40	7.16	8.19	7.28	8.23	5.16
MnO	0.59	0.61	0.12	0.33	0.34	0.53	0.18	0.14	0.09	0.15	0.08
MgO	7.14	10.08	9.91	10.47	10.94	11.47	9.41	7.70	10.27	9.06	10.09
CaO	22.74	23.16	22.36	23.05	22.51	22.83	22.55	22.09	22.37	22.20	19.19
Na2O	0.67	0.66	0.64	0.58	0.57	0.54	0.71	0.63	0.59	0.92	1.25
Total	100.97	100.81	100.71	99.23	100.21	99.99	98.65	100.15	98.68	97.91	97.90
Mg#	0.58	0.71	0.70	0.72	0.73	0.76	0.70	0.63	0.72	0.66	0.78

MAG B 25
SiO2
TiO2
Al2O3
Cr2O3
FeO
MnO
MgO
CaO
Na2O
Total
Mg#

TAA B 26
SiO2
TiO2
Al2O3
Cr2O3
FeO
MnO
MgO
CaO
Na2O
Total
Mg#

TABLE 2: Major element compositions of host and daughter Clinopyroxenes

MAG B 47	PYROXEN 71	PYROXEN 72
SiO2	49.32	42.00
TiO2	1.91	5.26
Al2O3	5.10	11.74
Cr2O3	0.31	0.07
FeO	5.38	7.69
MnO	0.05	0.14
MgO	14.53	10.84
CaO	22.56	19.34
Na2O	0.46	1.50
Total	99.61	98.58
Mg#	0.83	0.72

MAG B 25
SiO2
TiO2
Al2O3
Cr2O3
FeO
MnO
MgO
CaO
Na2O
Total
Mg#

TAA B 26
SiO2
TiO2
Al2O3
Cr2O3
FeO
MnO
MgO
CaO
Na2O
Total
Mg#

TABLE 3: Major element compositions of carbonate globules

MAGB25	4a	4b	5a	9a	9b	10a	10b	10c	11a	20a	25a	25b
SiO2	0.19	0.06	0.06	0.05	0.12			0.05	0.02	3.87	0.10	0.10
FeO	14.73	41.22	33.87	10.37	37.02	39.16	12.34	12.09	31.72	42.45	34.08	43.10
MnO	1.99	2.26	3.14	0.41	0.85	1.64	0.28	6.42	0.55	0.88	1.23	1.20
MgO	4.05	6.03	8.94	34.62	11.67	8.16	34.56	11.10	4.72	3.39	8.25	7.12
CaO	36.10	7.20	11.54	7.08	6.09	6.48	5.05	23.79	19.02	9.48	15.32	9.06
Na2O	0.08	0.10	0.14	0.22	0.18	0.12	0.21	0.28	0.17	0.19	0.30	0.12
SrO	0.11	0.05	0.02						0.07	0.06		
BaO		0.07	0.02		0.01	0.00	0.00	0.00	0.01	0.01	0.11	0.08
CO2	43.40	39.09	41.71	50.20	41.03	39.09	49.57	42.45	40.03	43.52	43.07	42.28
Total	100.65	96.09	99.44	102.96	96.96	94.65	102.00	96.18	96.31	103.85	102.47	103.05

MAGB25	25c	25d	25e	32a	35a	36a	44a
SiO2	0.05	0.71	0.10	0.03	3.00	0.09	0.11
FeO	17.38	26.86	30.27	28.97	46.39	13.94	0.87
MnO	0.26	0.46	0.66	0.56	0.81	3.08	0.78
MgO	30.49	11.09	13.91	2.39	4.12	8.01	1.01
CaO	4.25	18.20	12.85	24.67	4.61	29.42	51.91
Na2O	0.42	0.15	0.20	0.09	0.23	0.28	0.06
SrO	0.02	0.05	0.12	0.10	0.01	0.04	0.07
BaO	0.03	0.04	0.05	0.04			
CO2	47.80	44.31	44.58	40.23	41.59	42.62	43.10
Total	100.68	101.86	102.75	97.09	100.75	97.48	97.91

TABLE 4: Major element compositions of sulfides

MAGB47	42a	68a	70a	70b
Fe	33.57	58.28	60.01	32.69
Co	0.68	0.18	0.13	0.93
Ni	31.59	2.16	0.32	32.11
Cu	0.27	0.22	0.16	0.28
Zn	0.21	0.12	0.18	0.16
Pb				
S	33.03	37.95	39.39	33.65
Total	99.34	98.91	100.19	99.82

MAGB25	1a	1b	1c	5a	5b	12a	13a	16a	25a	25b	28a	28b	28c	32a	32b	33a	36a	42a
Fe	39.98	40.05	59.48	44.58	43.85	58.79	32.56	61.77	45.03	44.79	48.78	56.87	56.14	46.11	45.11	45.87	33.04	58.79
Co	0.13	0.07	0.09	0.28	0.23	0.05	0.05	0.09	0.09	0.13	0.09	0.37	0.16	0.11	0.67	0.08	0.16	0.03
Ni	0.33	0.55	0.06	0.80	0.83	0.13	0.51	0.19	0.64	0.86	0.34	0.63	0.34	0.09	0.48	0.04	0.67	0.10
Cu	22.07	21.73	0.06	0.22	0.32	0.03	30.22	0.10	0.11	0.30	9.08	1.93	0.65	0.01		0.04	23.64	0.04
Zn	0.15	0.03	0.03			0.04	0.22			0.02	0.04	0.04	0.01	0.01			0.06	0.07
Pb	0.18	0.11	0.08			0.11	0.06							0.04				
S	35.58	35.70	37.52	50.08	51.10	36.43	33.64	32.36	52.87	54.22	39.06	38.97	39.19	51.45	52.74	51.42	36.92	36.49
Total	98.41	98.25	97.33	95.95	96.33	95.57	97.26	94.51	98.74	100.33	97.40	98.80	96.50	97.83	99.01	97.45	94.49	95.53

TAAB26	14a	15a	34a	34b	38a	52a
Fe	55.79	44.64	58.37	58.93	56.63	30.76
Co	0.14	0.50	0.13	0.14	0.21	0.08
Ni	0.59	12.83	0.88	0.41	1.60	0.52
Cu	0.36	0.19	0.11	0.07	0.22	30.00
Zn	0.09	0.11	0.08	0.02	0.12	0.21
Pb			0.10	0.06		
S	37.55	35.84	39.57	38.64	38.14	34.58
Total	94.53	94.12	99.23	98.27	96.92	96.15

TABLE 5: Major element compositions of Spinels

MAG B 47	SPINEL 4	SPINEL 6	SPINEL 8	SPINEL 9	SPINEL 11	SPINEL 11 in Ol	SPINEL 13	SPINEL 15	SPINEL c 19	SPINEL m 19
TiO2	3.33	3.80	4.57	3.12	3.37	2.27	7.14	2.93	7.54	19.19
Al2O3	18.96	15.99	18.35	18.16	15.48	14.71	16.27	14.85	17.97	8.27
Cr2O3	40.33	40.57	36.67	42.65	42.78	44.78	33.00	40.14	33.81	18.31
FeO	26.16	31.66	32.57	26.62	30.84	27.72	33.09	32.27	33.62	41.73
MnO	0.34	0.46	0.54	0.36	0.58	0.37	0.52	0.47	0.44	0.45
MgO	9.72	8.01	7.54	9.44	7.37	12.24	8.39	8.24	7.09	9.41
NiO	0.07	0.27	0.28	0.04	0.30	0.38	0.28	0.29	0.07	0.06
Total	98.92	100.76	100.51	100.39	100.72	102.47	98.69	99.18	100.55	97.42

MAG B 25	SPINEL 7	SPINEL 55
TiO2	5.72	3.05
Al2O3	16.30	17.22
Cr2O3	20.13	30.56
FeO	46.69	38.94
MnO	0.88	0.27
MgO	9.19	9.53
NiO	0.78	0.14
Total	99.69	99.71

TAA B 26	SPINEL 2b	SPINEL 19	SPINEL 22	SPINEL 24a	SPINEL 24 b	SPINEL 38
TiO2	18.86	9.89	17.14	23.07	21.98	18.72
Al2O3	10.75	11.96	10.14	9.15	9.95	9.65
Cr2O3	12.01	12.89	11.03	7.70	7.69	13.98
FeO	46.66	55.93	54.16	54.11	55.62	50.89
MnO	0.46	0.43	0.59	0.56	0.56	0.59
MgO	8.06	7.58	6.00	6.35	5.44	6.33
NiO	0.20	0.44	0.43	0.40	0.42	0.48
Total	96.99	99.12	99.49	101.34	101.66	100.64

TABLE 5: Major element compositions of Spinels

MAG B 47	SPINEL 20	SPINEL 32	SPINEL 33A	SPINEL 33	SPINEL in Ol 33	SPINEL 34	SPINEL in Ol I34	SPINEL 41	SPINEL 43	SPINEL 45
TiO2	18.56	3.28	3.74	3.64	2.56	3.11	2.07	2.47	3.32	7.55
Al2O3	12.67	16.22	17.93	16.22	15.70	16.48	18.94	15.35	16.94	15.10
Cr2O3	16.31	37.98	38.53	38.64	37.67	40.57	40.28	37.07	35.58	13.73
FeO	41.97	33.87	31.14	32.65	32.19	28.36	26.14	33.82	33.81	50.95
MnO	0.40	0.32	0.44	0.42	0.37	0.45	0.38	0.40	0.41	0.44
MgO	10.61	9.67	7.65	8.48	10.17	9.17	11.57	10.49	10.16	10.64
NiO	0.12	0.14	0.31	0.21	0.25	0.21	0.32	0.27	0.26	0.30
Total	100.65	101.47	99.73	100.27	98.90	98.34	99.69	99.87	100.49	98.71

MAG B 25
TiO2
Al2O3
Cr2O3
FeO
MnO
MgO
NiO
Total

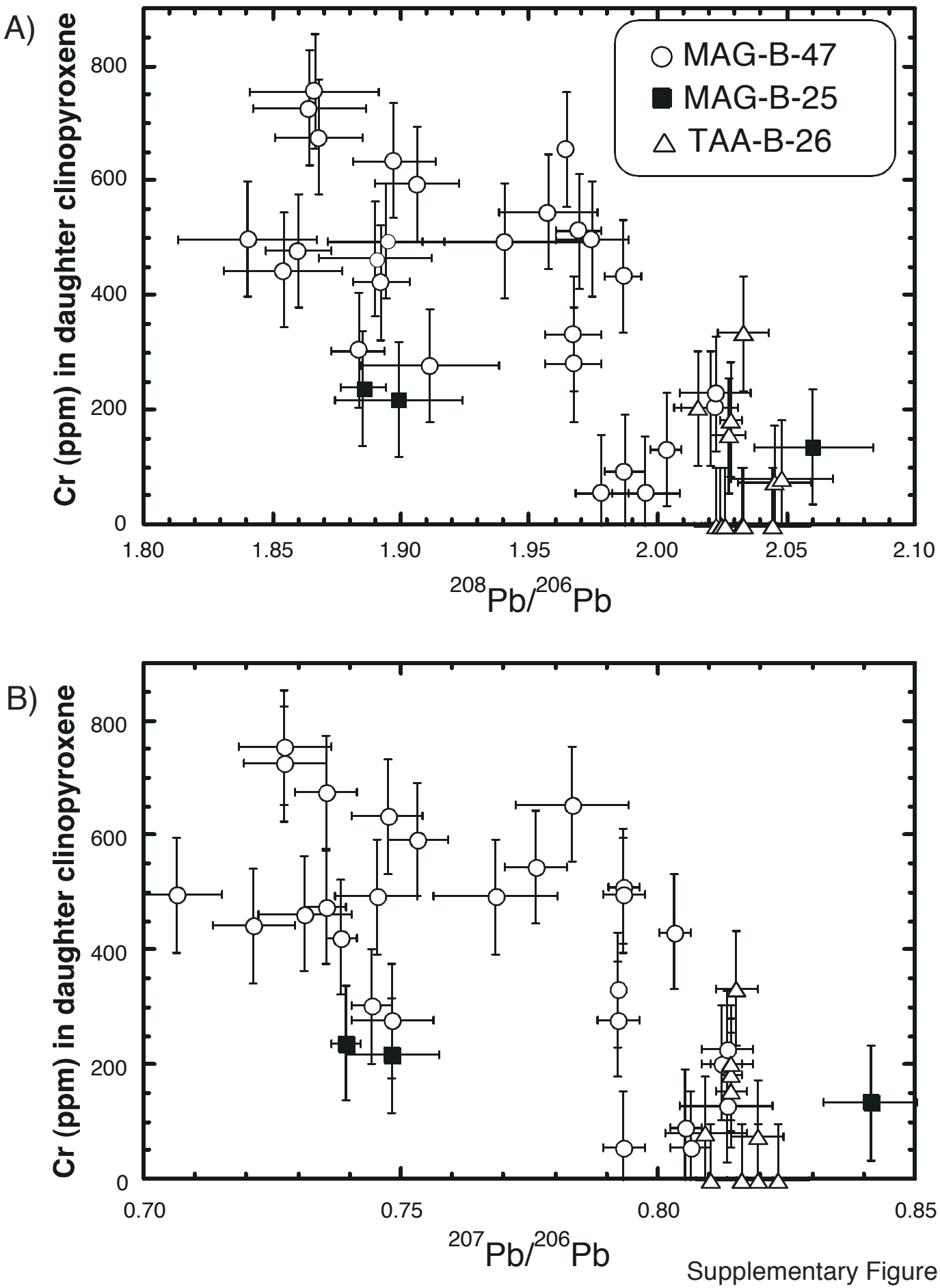
TAA B 26
TiO2
Al2O3
Cr2O3
FeO
MnO
MgO
NiO
Total

TABLE 5: Major element compositions of Spinels

MAG B 47	SPINEL in Ol 46	SPINEL 51A c	SPINEL 51A m	SPINEL 52	SPINEL I53	SPINEL 54	SPINEL63	SPINEL 67
TiO2	2.46	2.15	17.99	0.42	3.35	2.57	2.46	3.56
Al2O3	15.19	15.36	5.97	20.54	15.83	14.12	15.19	15.11
Cr2O3	36.13	41.65	17.72	45.38	41.81	42.54	40.45	37.57
FeO	34.96	30.85	54.75	22.75	30.10	27.89	30.43	35.28
MnO	0.25	0.34	0.75	0.30	0.55	0.31	0.98	0.34
MgO	10.43	10.83	2.95	11.44	8.45	11.15	9.98	8.03
NiO	0.10	0.27	0.19	0.08	0.26	0.15	0.59	0.13
Total	99.53	101.44	100.32	100.92	100.34	98.72	100.08	100.02

MAG B 25
TiO2
Al2O3
Cr2O3
FeO
MnO
MgO
NiO
Total

TAA B 26
TiO2
Al2O3
Cr2O3
FeO
MnO
MgO
NiO
Total



Supplementary Figure 1